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13 ABSTRACT

The paper uses three national security-related issued (Skybolt, SAM upgrade, and the Serpukhov computer) to illustrate a general discussion, in Part I, of the politics of technical advice, and in Part II to contrast the ability to deal with technical issues bearing on policy of the NSC staff and the Department of State. Part I treats such characteristic problems as the difficulty of obtaining "objective" technical advice in a political context; Part II is essentially an argument for strengthening the State Department's capability to deal with policy-relevant technical issues.

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PREFACE

The work presented here was done as part of an IDA Independent Research Program study on "The Integration of Technology into United States Foreign Policy." A second paper, dealing with institutional arrangements within the Department of State from a different viewpoint than my own, is being prepared by Dr. John Moriarty for publication later this year.

This present paper is one of a series by the author dealing with aspects of what we can call "the politics of technical advice." Related work includes a review of conflicting congressional testimony on the Safeguard ABM: "A Note on the SS9/Safeguard Debate," IDA N-753, July 1970; and a forthcoming study of the decision to go to the moon and the prolonged debate which followed inside the government on how to go to the moon. These case studies were funded under a grant from the Ford Foundation with additional assistance from IDA. I hope to conclude this series of papers during the coming year with a handbook for customers of quantitative studies, which would be a companion piece to the qualitative discussion of the politics of technical advice given in Part I of the present paper.

For many useful comments on a draft of the paper I am indebted to Lee Minichiello, John Moriarty, Ronald Finkler, Joseph Yager, and Laurence Legere of IDA; Henry Owen, Brookings Institution; Norman Neureiter, Office of Science and Technology; John Walsh, National Security Council staff; Seymour Weiss and Wreatham Gathwright, Department of State; and Eugene Skolnikoff, Massachusetts Institute of Technology. Naturally, the analyses and judgments made are the sole responsibility of the author. In particular, with regard to the comments on the State Department in Part II, roughly half of my reviewers hold views moderately to sharply at odds with those I offer.

CONTENTS

SUMMARY

Part I of the paper deals generally with the politics of technical advice, commenting in some detail on such characteristic problems as the elusiveness of objective advice; why superb technical expertise is not the most needed quality in a superb technical adviser; and what causes technical staffing to often degenerate into the pursuit of second or third order issues unlikely to change anyone's mind however they are resolved, if indeed they can be resolved.

Part II of the paper is addressed specifically to the problem of technical advice to the Secretary of State. To provide a contrast, this section begins with some comments on the current NSC system. The State Department access to and ability to use technical advice is then contrasted to that of the NSC staff, indicating that in this area (not inconsistently with other more salient areas) State is in the noticeably weaker position. The paper notes that this relative weakness tends to be perceived most strongly by persons outside State, while most inside either do not perceive it or regard it as unimportant. The paper reports on why these views are held within State, but argues that the situation really does justify an effort within the department to develop a stronger capability to deal with policy-relevant technical assertions from other departments. The paper suggests a possible step in this direction not requiring any substantial reorganization or commitment of resources. It closes noting that any meaningful strengthening of the department in this area--as presumably in others--requires an affirmative and effective interest at the top of the department.

Throughout both parts of the paper, three illustrative issues are used to bring out the points made. The Introduction to the paper describes these cases.

INTRODUCTION

It is now commonplace at the senior levels of government to face
issues that require a blending of technical and political judgment.
This paper summarizes three such issues. It then uses that case
material to illustrate the ideas discussed in the main body of the
paper. These ideas fall into two parts, of quite different character.
Part I is essentially about the deeply political nature of almost
everything connected with the process of staffing and reaching judg-
ments on technical considerations which affect a policy issue.
Part II then comments in a more speculative way on aspects of the role
of the NSC staff and the State Department, the two organizations which
are oriented primarily towards political consideration: and overall
questions of foreign policy and which do not, like the other agencies
involved (Defense, AEC, OST, CIA, and sometimes others), have a
natural capability for dealing with technical issues. The particular
focus of the paper is on presidential decisions; but the points made
would apply in much the same form to more modest levels of decision.

One of the cases is an old one--the Skybolt affair of 1962; the
second involves a decision to acquiesce in the British sale of an
advanced computer to the Soviet Union (an incident that, on a small
scale, has a number of parallels with the Skybolt affair); the third
sample is from the current SALT negotiations--dealing with the pos-
sible upgrading of Soviet anti-aircraft defenses to provide a
capability to engage strategic missiles. For information on Skybolt,
I have drawn heavily on the work of other writers, particularly
Richard Neustadt, supplemented by interviews with several of the
supporting actors. For the two more current cases, I discussed the
issues with officials from State, ACDA, Defense, and the National

Security Council. But the interviews had to be handled very differently. In the case of the computer sale--a matter of modest intrinsic sensitivity--it was possible to discuss the substance of the issue in considerable detail. On SALT, this condition was reversed. I did not expect--and my interviewees made it clear they did not expect--to discuss substantive details. But on the basis of information in the public record it was possible to talk about the subject in a general way. The combination of these two issues--one minor, but which could be discussed in detail; the other major, but which could be discussed only in general terms--provided a sufficient basis for the discussion to follow.

Here, in quick outline, are the cases:

1. Skybolt[1] was a weapon in dispute before it was born. The Air Force wanted it badly and to help sell it made rather grand claims for its prospective accuracy and reliability and very modest estimates of its cost. Outside technical reviews uniformly questioned the Air Force claims. But, partly as a hedge against difficulties with Minuteman and Polaris (neither yet in service) and partly simply because the Air Force's strong feelings could not be completely ignored, the Eisenhower administration let it get going. Meanwhile, the British were looking for a way to keep a plausible, or at least not implausible, independent deterrent. A British missile development (Blue Streak) was proving very expensive. And their Air Force shared with ours a preference for flying over silo-sitting. At an Eisenhower-Macmillan meeting at Camp David in 1960, we agreed to let the British buy Skybolt, contingent on its successful development, and to consult with them about what to do in the contrary event. The Macmillan government committed itself very heavily to the weapon, insisting on its great value in the face of strong attacks from the

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1. A ballistic missile designed to be launched from an airplane. Its range would have been about 1000 miles.

Labor opposition and quieter misgivings from within the government itself. Meanwhile, Skybolt slid downhill. At the end of 1960, Defense Secretary Gates was tempted to kill it, but he passed on the problem to 'he new administration: the last Eisenhower budget provided no funds for Skybolt but also no explicit cancellation. McNamara at first provided funds to continue the program. But by August 1962, with Polaris and Minuteman confidently in service and with Skybolt continuing to escalate in cost and slip in performance, McNamara had decided to kill it. This information was very closely held. For tactical reasons the blow was to come at the budget review in December.

How soon the British foresaw what was to come is unclear: tactical considerations on the British side motivated no one to raise the problem until the Americans did. How soon the American State Department was forewarned is clear: not until almost three months after McNamara had for all practical purposes decided to kill the weapon. The issue was then faced of what, if anything, to do for the British if indeed Skybolt was to die. This was a minor issue from the Defense point of view, where there were no strong feelings about what should be done. It was a major issue at State, where there were very strong feelings about one thing which should not be done. For a variety of reasons, including but not limited to its possible effect on Britain's effort to join the Common Market, State was persuaded that the British should not be allowed to buy Polaris missiles.

When the news of Skybolt's cancellation broke, a terrific fuss was stirred up in Britain. What had been intended as a largely social meeting between the Prime Minister and the President at Nassau became a crisis summit meeting to resolve the Skybolt matter. The British ended up with Polaris. De Gaulle vetoed the British bid to enter the Common Market, citing Nassau as evidence that the British were tied to America and not ready to be true Europeans. Naturally, State saw in this confirmation of its warnings. (To the White House and Whitehall it seemed doubtful there was really any cause and

effect connection between the two.) In some way or other, nearly everyone got something he wanted out of the fuss: whether they judged rightly or wrongly, Defense, the White House, the British, and alas even the French found the outcome convenient. The only clear loser was the State Department, which had been so late to learn what was impending and entirely ineffective in influencing what went on thereafter.

2. Our second issue, although very useful for the purpose of this paper, was far less consequential than Skybolt. But again, a meeting between the President and the Prime Minister--this time, Christmas, 1970--was the critical turning point in its resolution. The background of the Serpukhov computer is this:

There is an agreement among the leading NATO nations, together with Japan, to restrict the sale of strategic material to the Soviet Union and other Communist states. This is formalized in an organization called COCOM, the Coordinating Committee on East-West Trade. Within the COCOM agreement, exceptions can be allowed for items on the forbidden list, but this requires unanimity. A complicated set of rules (roughly as complicated and impenetrable to laymen as the rules defining an America's Cup yacht) delimits what we will loosely call the largest class of computers that can be sold to the Russians. The computer the British wished to supply for Serpukhov would far exceed these rules, and indeed would far exceed the largest computer for which an exception had hitherto been allowed. On the other hand, if the exception the British were asking was extraordinary, so was Serpukhov. The Soviet installation there is the most powerful particle accelerator in the world. Such machines--the United States is currently building a still more powerful one at Batavia, Illinois, at a cost of several hundred million dollars--are used to probe the fundamental nature of matter. The work is substantially international in character. American scientists frequently visit and some are even in residence at Serpukhov, and Soviet scientists will reciprocate at Batavia. The work, in short, is regarded as very important by the

4

world scientific community but without any military implications--
indeed without any practical applications whatever, so far.

Now a machine like Serpukhov generates the need for a very large
amount of computing to analyze the enormous amount of data it produces.
Western computers are far superior to Soviet computers. An advanced
Western computer could handle the work generated by the Serpukhov
laboratory far more efficiently than the best Soviet computer avail-
able to the laboratory. Thus there was nothing suspicious at all
about the Soviet desire to buy Western equipment.

There were, nevertheless, two matters of concern. The first was
the possibility that the Russians would use some of the computer time
to run military calculations--the design of nuclear weapons, in
particular, can make use of very extensive computer runs. The second
was the possibility that merely to approve the sale of so large a
computer, for however reasonable an application, might make it hard
to hold the line against the sale of more modest computers in more
debatable cases.

The United States vetoed the British request for an exception to
the COCOM restrictions. As in the case of Skybolt, this happened just
prior to a routinely scheduled meeting between the President and the
Prime Minister. Although the issue was hardly important enough to
dominate the meeting as Skybolt had almost exactly eight years earlier,
the eventual outcome was the same. Mr. Heath told Mr. Nixon that the
sale was an important one for the British computer industry, and hence
for Britain; Mr. Nixon ordered a re-study of the issue; and the even-
tual result was that, as with Polaris in 1962, the British got what
they wanted.

3. The third issue, surface-to-air missile (SAM) upgrade, turns
on the fact that there is no absolute distinction between the external
appearance of an advanced bomber defense and an anti-missile defense.
In each case, what can be seen are some radars, and some missile
launchers. Depending on the visible characteristics of the system
(where the missiles are, what they look like, where the radars are,
and so on), and on some mixture of intelligence and assumptions about

the invisible parts of the system (computers, doctrine, communications, etc.), a judgment can be reached on whether the system is capable of shooting down missile warheads. If this judgment is affirmative, a further contentious question must be faced: whether it is only theoretically conceivable that the system could shoot down a warhead; or whether the system should actually be credited with practical significance as a missile defense.

This issue first came to public notice in the mid-1960s, when the Soviet "Talinn" system (so named after the town near which a large radar was detected) was interpreted by the Defense Intelligence Agency as a Soviet ABM and by the Central Intelligence Agency as a bomber defense. Eventually, there was general agreement that the Talinn system was indeed a bomber defense. The issue later took on a new form in the context of the SALT negotiations, where both sides expressed interest in an agreement to limit ABM deployment. Two questions arise: first, although the Soviets may have originally intended the Talinn system as an anti-bomber defense, might it be possible to upgrade the system to give it a capability against missile warheads; second, could the Soviets deploy some still more advanced system, asserting it is a bomber defense and therefore allowed by the agreement, but which the United States might reasonably suspect is an ABM system?

Now what happens when the government has to deal with issues such as these, all of which involve technical judgment, but require a political decision? Consider the last of our three cases, SAM upgrade: we can surmise[2] that in the bureaucratic process of staffing the issue, there will be proponents of all of the following viewpoints and of various gradations between them:

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2. From information in the press and in congressional hearings on the SALT negotiations and on the administration's ABM proposals, and from parallels with past issues, such as the debate over the detection of underground nuclear explosions over the past decade.

6

a. There will be people who just do not believe an ABM agreement would be a good idea--either in general, or more narrowly in the sense of not wanting an agreement on ABM unless it is part of a more comprehensive arms control agreement that is currently in prospect. They will naturally be disposed towards stubborn conservatism on the SAM upgrade issue.

b. There will be people who want--or at least are willing to accept--an ABM agreement, but who are genuinely concerned about the prudence of such an agreement without strong safeguards against clandestine deployment.

c. There will be people who are not too concerned about SAM upgrade as a substantive issue, but who are inclined to treat it as if it were a serious concern as a bargaining counter with the Russians--or merely as a bargaining counter within the US Government--on other aspects of a SALT agreement.

d. There will be people who are not too concerned about the substantive issue--that is, they are not really concerned about the risk of a strategically significant clandestine ABM--but who are concerned about the political unwisdom of handling the problem in a sloppy way, and so setting an unhealthy precedent. They want a clear definition of what an ABM is and of how an ABM system is to be distinguished from a bomber system spelled out in any agreement. Otherwise they foresee recriminations within the United States about whether our interests have really been protected, and whether the Russians might be cheating.

e. Finally, there will be people who find it hard to take the issue seriously at all, and see the whole argument on SAM upgrade, at best, as a misplaced concern with minor detail, and, at worst, as an excuse for sabotaging the talks.

The problem is to decide how to handle this issue in the talks with the Russians. The resolution will presumably fall somewhere between the extremes of (a) forgetting the whole issue as too trivial to bring up, and (b) insisting that there can be no ABM agreement that does not provide for detailed on-site inspection of Soviet radar and defensive missile installations. As is apparent from the spectrum of positions we have summarized, the resolution will depend heavily on political and broad strategic judgment. What the White House wishes is to have the narrower technical issues identified, defined,

and put into perspective. But the specialists dealing with these narrower technical issues will themselves be affected by the same broader considerations the President must ultimately employ. They will also be affected by the point of view of the organization for which they work. We can reasonably assume that Defense Department experts will generally be in positions somewhere near, if not exactly at, the top of our spectrum, and that experts from the Arms Control and Disarmament Agency will appear at the lower end. We can therefore expect that there will be sharp differences of judgment at "the working level" on the technical issues, and consequently no _easy_ way to see that the President gets the paper he desires, which is a clear and sound perspective on the narrow technical issues free of political and strategic judgments which the White House naturally wishes to reserve for itself.

Part I of this paper is devoted to this kind of problem.

PART I

What I want to do in this part of the paper is to describe the work-
ings of three generalizations about the process of integrating
technical and political judgment, using the case material to provide
some concrete illustrations. The first deals with the problem of
objectivity, the second with the character of policy-relevant tech-
nical advice, and the last with the political nature of the process
by which technical issues are staffed. The comments I make about
technical advice will, I hope, seem sensible even to persons with a
very different view than mine of the substantive issues in the three
cases. But ocassionally these may be apparent, which is an intrusion
that I would prefer to avoid. Ideally I would be completely even-
handed, but then the paper would become very hard to write and, more
germane, all but impossible to read. The concrete illustrations
would be submerged in a sea of perhapses. That this dilemma exists
leads us directly to the first generalization.

1. There is no such thing as objective technical advice in the sense
of an assessment of the technical issues in a political controversy
which will be accep_ ble to all parties as a fair and adequate state-
ment.

This elusiveness of objective technical assessment is a conse-
quence of essentially the same problems that make objective political
commentary elusive. But because of the relatively precise character
of technical arguments, it is easier to describe just how the diffi-
culty arises. We can consider in turn the differences that derive
from basic judgments, extrapolations, context, bargaining, and con-
densation.

Basic judgments. It is often pointed out that it is rare for the technical experts to be really far apart on basic technical judgments. This is not only true, but a truism. For whenever the experts disagree, they can be pressed to state the basis for their judgments. Sooner or later we can in practice always push down deep enough to reach a point where there is no significant disagreement. It then becomes true that the technical experts are really not far apart. Closer to the surface differences can occasionally be uncomfortably wide.

For example, in the Serpukhov case the question arises of how important it would be to Russian military programs to have available a computer much more powerful than they appear to have. This would help us judge how much the Russians might be tempted to divert some of the Serpukhov operation to military calculations and how significant it might be if the Russians did engage in clandestine diversion. A principal concern has been diversion to calculations useful in the design of nuclear weapons. In the United States some weapons calculations have been so elaborate that it would take six months or more of full-time operation of the Serpukhov computers to carry them out. It would certainly be awkward, expensive, and perhaps simply impractical to carry through such calculations with known Soviet equipment.

But in all fields computational power has turned out to have what the economists call highly elastic demand. That is, as it has become cheaper to do computations, the specialists have responded by doing far more computing. Opinions on the practical effects of this trend vary widely. Enthusiasts tend to see a truly revolutionary development. Skeptics see a great deal of the enlarged computational effort going into marginal ventures of no particular importance. Consequently, some experts will see the elaborate computations that have been done in US weapons laboratories as crucial; others will believe that roughly the same progress would have been made if the US programs had been restricted to the use of the kind of computer

assistance presumed available to the Russians.[1] Such differences in
basic judgment rarely have anything to do with the nontechnical
interests that inescapably come into play later on. The experts
simply disagree, with no strong correlation between their views on
the technical issue and their inclinations (if any) regarding the
policy issue. For such views are typically formed during arguments
among specialists outside the context of a larger policy question.
Nevertheless, these pure differences of judgment interact with the
political context. First, even small differences here can provide
the roots of larger differences that develop later in the process;
second, even where the differences among the experts are generally
free of nontechnical influences, the choice of officials at a higher
level of which expert to believe often are not.

Yet despite all such necessary qualifications, it is still a
useful rule-of-thumb that policy-relevant disagreements among tech-
nical experts only occasionally derive from differences of technical
judgment on what can be considered basic technical questions. The
differences arise primarily in the further steps to be described
below.

Extrapolation. It is practically never the case that basic
technical judgments are adequate to the policy-level decision. For
one thing, the policy-level decision generally requires a judgment
on the future impact of the decision. So it becomes necessary to ask
not merely what the situation is today, but what it is likely to be
five years from today. Naturally there is much more room for a dif-
ference of judgment here than regarding the basic situation and, in
contrast to the basic questions, this kind of question is likely to
be addressed in a context in which people are aware of the possible
political implications of their judgment.

A second kind of extrapolation is also frequently required: an
extrapolation from what we know to what is likely to be true of
secret developments in some foreign country.

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1. Which, of course, would hardly be negligible in our case.
Soviet capabilities are generally assumed to be equivalent to US
capabilities five years earlier.

Skybolt provides us with a good illustration of the first case, Serpukhov of the second, and SAM upgrade conspicuously involves both kinds of extrapolation.

On Skybolt there was the typical situation of all ambitious R&D proposals. When the project was being considered, there was general agreement that serious problems had to be solved before a weapon meeting the Air Force specifications could be developed. Nevertheless, the Air Force could produce experts who judged the task was a reasonable one, and outside reviewers could not prove they were wrong. Consequently a fairly modest disagreement about what could be done within the existing state-of-the-art produced a wide disagreement about what could be reasonably expected with a few years' work.

On Serpukhov we face again the question of how important use of the computer might be to (especially) the Soviet nuclear weapons program. Here the difference of opinion about how important elaborate computer calculations are to the American program grows larger for two reasons: first, we run into the question of what computational resources the Soviet weapons laboratories already have, a question that would involve extrapolations from whatever intelligence exists on Soviet classified computer work; second, any argument about the importance of large computers to the American weapons program will inevitably be enlarged when we try to make judgments about the Russians. For in every field where computers are used for something more than a huge data filing and collating machine there will be a trade-off between the use of very sophisticated mathematics to analyze problems and the use of relatively simple mathematics exploiting the brute force capability of the computer to run through vast numbers of detailed calculations.[2]

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2. A simple example: Suppose I want to calculate the probability of getting three of a kind in a hand of poker. If I do not have a computer but know some probability theory, I can calculate the answer on the back of an envelope. If I know nothing about the mathematics of probability but have a computer, I can also get the answer. I program the computer to make up the equivalent of a shuffled deck of cards, deal them out in packets of five, (continued)

In US weapons laboratories, where computation is cheap, there will naturally be more emphasis on the brute force techniques. The Soviet laboratories, presumably making do with more modest computational resources, will put more emphasis on very sophisticated mathematics. It will be hard to judge from American experience how well the Soviets have done on this route.

In sum, the need for estimates about the future, or to move from what is known of Soviet development to what is probably true, allows modest differences in basic judgments to grow into widely diverging extrapolations.

Context. The next problem is to work the technical judgments into the context of the sorts of questions that are of direct relevance to the decision. In both the Serpukhov and SAM upgrade cases a directly relevant question is whether the Russians are likely to cheat. There is no way to answer such a question other than in terms of an overall assessment of a number of political and a number of technical elements taken together; there will be no way to draw a clean line of separation between the technical elements and political elements in the overall judgment. Are the Russians likely to divert some of the Serpukhov computer operations to military programs? That would depend, among other things, on how important diversion of the computer capacity would seem to the Russians (partly a technical judgment, partly a judgment on how the Russian bureaucracy would behave[3]). It would also depend on how the Russians would judge the

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and then count what proportion contains three of a kind. I then tell the computer to do all this a thousand times or so. The answer I get from the computer will be an approximation of the theoretically exact answer I get from the calculation. For all practical purposes, though, the answers will be identical. The speed and ease of programming of modern computers is such that setting up the problem and running the thousand iterations would take only a few minutes.

3. If the Russians were to seriously consider diversion, the arguments of the weapons scientists for diversion would presumably be countered by arguments from other parts of the Soviet bureaucracy against doing so. For example, those scientists who persuaded the Soviet government to invest several hundred million dollars in high-energy physics laboratories would have strong incentives to oppose any such diversion.

risks and consequences of detection if they did divert (partly a technical judgment on the ability of Western experts working at Serpukhov or with access to printouts from the computer to sense that something improper was going on; partly a judgment of how much the Russians would worry about a Soviet technician deliberately or inadvertently alerting the Westerners; partly a judgment on how much the Russians would worry about the consequences of being caught, or of the possible leak of classified information, or of the consequences of arousing strong suspicions about their activity even if nothing could be proved).

Ideally we could prepare an agreed list of questions, purely technical in nature, and submit them to the technical experts. These would then be responded to by the technical experts within the relatively apolitical context described earlier under "basic judgments." In practice, though, this is never easy to do. Technical advisers reflecting different policy views will differ on what narrowly technical questions are really important, on how the technical questions ought to be formulated, and, most fundamentally, on how the answers to such questions would fit into a policy context. The ideal procedure generally turns out to be as unrealistic as asking a man to taste a bowl of beef stew and give you his judgment on the potatoes, ignoring the rest of the stew.

Bargaining. The problems introduced by the need to put the narrow technical judgments in context (or, alternatively, by attempting to get them out of context) merge into the problem I will call bargaining. The distinction is that in one case the differences in judgment on broader questions reflect no intentional influencing of the technical judgment. (The man who loves beef stew genuinely finds the potatoes tasty; not really too good, thinks the man who hates beef stew.) Bargaining, though, is conscious. It is generally hard to be sure where one leaves off and the other begins; hard for an outsider and often hard for the person making the judgment himself. A good example can be seen in the Skybolt case. I think it is fair to say that the Air Force interest in Skybolt never really turned on

14

an expectation that the original specifications for the weapon could be met. The principal interest was in developing a new kind of weapon--the airborne strategic missile, a Polaris of the air. The Air Force judged it wise to have this kind of weapon available for the 1960s and 1970s, and it was consequently relatively unimportant that the first version of the weapon--the Skybolt--might not really be justifiable on narrow cost effectiveness grounds. On the other hand, it was bureaucratically important (even before McNamara) to present a case that the new weapon would be a promising addition to the arsenal in cost effectiveness terms. Hence a specific mission was found (suppression of air defenses) and a case was made that Skybolt would have a sufficiently attractive combination of yield, accuracy, reliability, and cost to justify its development for that mission. This case was challenged by essentially every outside review group that examined the question. But since the Air Force interest in the weapon was not really contingent on this cost effectiveness case, the Air Force was highly motivated to make as good a countercase as it could manage and in no circumstances admit that its claims were almost certain to turn out to be overstated. Thus there was no possibility of an agreed technical assessment on Skybolt.

This situation is commonplace, and characteristically no one can prove when a position is being adhered to because it is seriously believed in and when simply to strengthen a bargaining position. It encourages, naturally, a certain mistrust among the participants in a technical controversy. This is generally justified. Dr. A mistrusts Dr. B and thinks he is deliberately overstating his case. A, who tells himself that he would like to be perfectly fair and candid, nevertheless decides that in dealing with someone as unscrupulous as B he had better be very careful not to say anything that could be taken out of context and used against his case. B, meanwhile, notices that A refuses to clearly concede what seems to be an obvious point. He congratulates himself on avoiding a possible damaging concession earlier, which no doubt would have been shamelessly exploited by the unscrupulous A. And so on.

Condensation. Finally, and really most crucial of all, there is the fact that the technical arguments must be summed up and put in a form that can be used by the senior officials responsible for the decision. It is quite possible, even very likely, that on any case we could get the various sides of a technical dispute to agree on a common statement of the technical issues--provided there was no limit on the length of the paper and no need to find relatively nontechnical and hence relatively imprecise language to make the technical points comprehensible to a nonspecialist. But of course there are severe limits on both counts. It is that need for a nontechnical summing up that makes the ideal of an agreed and adequate statement of the technical issues a complete will-o'-the-wisp--a dream never to be encountered in the world of practical affairs.

An important corollary to all this is that a critical role emerges for the personal technical advisers to the decision-maker (or at least to his chief of staff). This does not necessarily mean a single individual or the same body of people for all matters: different people may play that role on different issues. The personal advisers may be formal members of the staff; sometimes they may be outsiders. The important point is that the impracticality of obtaining a generally agreed technical assessment on controversial issues means that the decision-maker must look to someone he can trust, not in the sense of necessarily having superior technical judgment to anyone else, but in the sense of someone he can trust to shrewdly perceive the problem from the decision-maker's point of view, and to sum up the relevance of the technical arguments from that point of view. (Plainly, this requires political as well as technical judgment, a point I will return to.)

This leads to our second generalization.

2. The critical function of technical advice relating to policy issues is to find a line of questioning which "organizes the issue" and puts the technical considerations into a form and context in which they can be appreciated by the decision-maker.

What the decision-maker wants is staffing that defines, puts into context, and focuses the issue on those aspects of the problem to which he wishes to apply his own judgment. This applies generally, whether there is technical content in the issue (the focus of chis paper) or not. If the decision-maker is the President, he is likely to wish to apply his own judgment to questions of the impact of his decision on the leadership of other major nations and any domestic political implications. He is entirely unlikely to want to apply his own judgment to a technical question (such as the extent to which diversion at Serpukhov might help the Soviet nuclear weapons program), but he also may not want to apply his own judgment to such an essentially political question as the effect that his decision on Serpukhov would have on future negotiations with our allies on controls on computer exports to the Soviet bloc. So, there is not an absolute contrast between technical issues—which the President does not feel qualified to judge and which he therefore wants to be summarized and put into context—and political issues, where the President wants to make his own judgments. Rather, there is a spectrum ranging from high-level political judgments which the President may not want the interagency staffing to even consider, to narrow technical and political issues where, due to some combination of the President's own lack of taste for or familiarity with the issue or the relative unimportance of the issue, the President wants that part of the thing completely "staffed out" so that he does not have to consider the details of its assessment at all.

But presidents are necessarily men much interested in and much experienced in political questions, and characteristically with negligible technical background. Consequently, the tendency will naturally be to rely much more heavily on staffing for technical than political judgment. A second important difference between technical and political judgment is that it often is possible to find a quantitative way to handle a technical issue, and this has the effect of making it easier (not absolutely easy, but relatively easier) to break off and summarize technical aspects of the problem than to do so for political

17

aspects. This last point, on the relative ease of summarizing technical aspects of an issue, might appear to conflict with the stress in the previous section on the impracticality of getting agreed summaries of the technical situation. But the key word is "agreed"; the President does not need "agreed" technical appraisals, although it is nice to have them. What he needs is a technical appraisal from someone in whom he has confidence. To make the situation clearer, we turn to the details of Serpukhov.

Let me first summarize how this issue was formulated in a way which did not require that the President deal with the technical arguments. We will see that Serpukhov turned out to be an unusually simple case from this point of view, even though at first sight it might seem that at least two difficult-to-resolve technical questions had to be faced:

1. How much might a favorable decision help the Soviet nuclear weapons program (or other military programs which could use extensive computations), given the possibility that the Soviets might attempt clandestine misuse of the machines?

2. Certain controls were to be part of the sales agreement: how successful were they likely to be in discovering such an attempt at misuse if it were made?

What made Serpukhov simple as a problem in using technical judgment was that it was possible to "bound the problem" in a way that made the first question irrelevant and the second far less troublesome.

To start with, it was possible to limit consideration to the risk of Soviet diversion of the computer at Serpukhov: there was no need to worry about the possibility that, due to laying their hands on the model at Serpukhov, the Soviets would be able to copy the technology and begin manufacturing similar machines themselves. (The Soviet problem was a lack of "know-how" in the manufacture of the super-miniaturized electronic devices that are the key to efficiency of the most advanced computers. But the Soviets already had access to samples of these devices. Consequently anything that

could be gleaned about production techniques from examination of
sample units was already available to them. Supplying or not supply-
ing a Western computer to Serpukhov could hardly have a significant
effect on Soviet capabilities to produce such devices on their own.)
Further, the Soviets could hardly divert all of the Serpukhov computer
installation without it being obvious that something suspicious was
going on. A quarter, or perhaps a third, was conceivable. Certainly
not much more, and perhaps not that much. Now the Serpukhov instal-
lation was to be equivalent to about four or five of the best com-
puter the Soviets were known to be producing, the BESM-6. This
meant that, at worst, the advantage to the Soviets of cheating would
be comparable to what they could gain from building one extra BESM-6.
How many BESM-6s (or their equivalent in unpublicized larger machines)
the Russians would have anyway by the time the Serpukhov installation
was ready to operate was in dispute. But no one seems to have doubted
that it would be something close to fifty, and perhaps considerably
more than fifty. Even the lower estimates made it implausible that
the Soviet nuclear weapons development (or some other top-priority
military effort) was seriously suffering for the lack of one BESM-6.
(The cost of building a BESM-6 appeared to be around $4 million.)

Now once the problem had been bounded in this way, certain things
became beyond serious dispute:

a. The direct security risk involved verged on the negligible.
Even if the Russians attempted to cheat they could hardly gain much
more than they could perfectly "legally" by building one more BESM-6.

b. Largely because of (a), the likelihood that they would try
to cheat seemed very low. For this would necessarily involve some
risk of being exposed; some restrictions on exploitation of the
Serpukhov laboratory in which the Soviets had invested a great deal
of money and top scientific talent; and some risk of exposing Soviet
classified information to Westerners working with the computer.

Thus the first question became irrelevant. A negative American
decision could not deny the Russians the ability to do calculations
they deemed terribly important. The second question became marginal:

given a low probability that the Russians would be tempted to cheat and a low risk to the United States if they did, then the need for high confidence that cheating would be detected became easily questionable.

A more serious problem was the precedent that the Serpukhov approval would set. But even here the risks were hardly spectacular, even assuming both that additional such sales would be made _and_ that the Soviets would cheat. Further, a hard-nosed line on Serpukhov, which would certainly alienate at least the British, was a questionable way to encourage our allies to hold to export restrictions in areas where the case for them seemed more reasonable.

It is scarcely surprising then that the eventual decision was to let the sale go through. The risks that the Soviets might divert part of the computer running time to unauthorized uses were inconsequential compared to the political elements in the case, particularly the effect that the decision might have on US-British and US-Soviet relations. The matter of precedents was more troublesome. But even here the security risks hardly seemed overwhelming, and denying the sale did not eliminate, and might even have aggravated, the problem. On the whole, the political and technical elements were favorable to the sale, although one can conceive of circumstances that would lead to a contrary judgment.[4]

In sum, then, the case turned out to be so simple that the reader might wonder why it was a case at all. Yet, in fact, as was reported in the press, the decision did come to the President in the form of a "split paper" with a number of agencies, led by Defense, opposing the sale, while a number of others, led by State, supported it. And this split was not limited to conflicting judgments about political aspects of the issue. Nearly all the participants (but, naturally, particularly the losers) felt that others had misstated the technical facts. That is what makes the issue interesting for our present purpose.

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4. For example, difficulty with the Russians or British or both on other (perhaps even unrelated) issues, especially when combined with the congressional concern about the sale which did exist in the Joint Committee on Atomic Energy.

Looking back, it is easy to see that the critical step was deciding what was the right question. "The right question" will often seem obvious in hindsight. But we should be careful not to assume therefore that the question was asked at the outset of the staffing of the issue. Nor can we assume that, even after the fact, there will be agreement on what "the right question" should be. For typically, the judgment required to ask the right question is substantially political. The various parties will tend (with varying degrees of technical shrewdness and bureaucratic shrewdness) to formulate the question in a way that produces an answer consistent with their policy views.

To clarify how this worked in the Serpukhov case, let me provide a bit more detail on the issue than I gave in the Introduction to the paper. The case actually went through three phases. In the first, the Russians were negotiating to obtain an American computer: the CDC 6600. This was a logical choice, since this is the machine used at all the major Western high-energy physics laboratories. Indeed the hope of the Soviet scientists was that the United States would provide the machine as its contribution to the work at Serpukhov, in which American scientists were to participate. In this context (a proposed American gift of a high-powered computer to a Russian institute), a study was commissioned from a panel of experts to see if safeguards could be designed to assure that the computer could not be misused. The panel judged that to be a very difficult thing to do. But the issue was never formally resolved. For the Atomic Energy Commission, which was to provide the funding, foreclosed the issue by yielding to congressional pressure and promising the Joint Committee on Atomic Energy that it would not go through with such a deal. (The Joint Committee has traditionally taken a most cautious view on the export of technology or equipment that could conceivably be used for nuclear weapons development.) Nevertheless, in principle the decision within the interagency committee dealing with export controls (principally State, Defense, and Commerce) was to veto the proposal. The Russians then approached the British, proposing to buy two British ICL 1906s, a combination equivalent to the American CDC 6600.

This proposal required US approval both under the COCOM agreement and because a good deal of US equipment and parts went into the British computer.

Defense could always be relied on to oppose the sale; State generally favors relaxation of trade barriers and so, even more, does Commerce, whose constituency after all is largely business firms who want to do business. But at the level of routine interagency staffing, the British request was probably foredoomed. Commerce was hardly inclined to fight for a British sale after agreeing to disapprove an American export license for the same installation. Defense, of course, was opposed. And State was not prepared to fight the issue without Commerce support.

This decision reached the British in November, and Heath took up the issue with the President in December, apparently after being told by his advisers that the American position was taken by relatively low-level officials and was quite irrational.

At this point came the third round, the one which is our immediate concern. Here a new element entered the picture. The Office of Science and Technology (headed by the President's science adviser) had a view of the whole situation which was not inconsistent with that of the British. OST had favored providing the CDC 6600 (with reasonable but not necessarily foolproof safeguards) essentially on the grounds outlined in the previous section. There was apparently an inclination in OST to fight the decision to bar the CDC 6600, but the issue slipped away when the Russians chose themselves to forget the CDC machine and approached the British. When the issue was reopened at the Heath-Nixon level, State was entirely ready to support a reversal of position and OST was eager to do so.

Defense, on the other hand, saw its duty as that of opposing exports of any potential military significance. More generally, in the face of the erosion of export controls in recent years, Defense saw its proper role as arguing against any further relaxation. So from the Defense viewpoint, the proper questions were: Might this sale lead to any possible strategic advantage to the Soviet Union?

22

If so, are the safeguards provided strong enough to foreclose that possibility? To the first question, the answer is possibly yes; hence the safeguards question becomes relevant. Its answer is, at best, perhaps not. Hence, from the Defense point of view, the sale should not be allowed. It _might_ involve giving a potential enemy help in developing new weapons, and it would set a precedent for more of the same in the future.

From the State viewpoint, the proper question was: Are the strategic risks in the sale important, considering the various political difficulties created by the restrictions? State strongly suspected they were not. But posing the question in this way suggested a need to estimate what the Russians might accomplish with the additional computer capacity they conceivably might gain, and then balancing this against the political elements in the case. Neither portion of this could be done unambiguously. The question of safeguards was one State preferred not to deal with at all. It would like to make a political judgment that the game was not worth the candle, which would sweep aside the relevance of the safeguard question.

OST, though (although in form abjuring any position on the policy issue as beyond its jurisdiction), was able to pose the question State wanted to ask in a more precise way that allowed a crisp answer: namely, assuming the Russians were to cheat at Serpukhov, how much could this add to their capacity for doing military-related computations? How difficult would it be for the Russians to provide this same additional capability from their own computer industry if they judged it really important? Put in this way, it was possible to draw a clear-cut answer, as we saw in the previous section. The security risks in the transaction were quite inconsequential; it would be foolish to allow these risks to control the decision if on political grounds it seemed sensible to go ahead.

In posing the issue in this way, OST was, like the others, reflecting its institutional interest: OST's constituency is in part the nongovernmental scientific establishment, where there was broad

support for the sort of international science cooperation of which the Serpukhov arrangement would be an outstanding example. Thus OST, like State, was motivated to find a way to frame the question that was likely to support an affirmative decision. But, unlike State, it was able to see how to do that most effectively. Defense shared with OST the technical sophistication to frame the question in the same way, but was not motivated to do so. In all this, I cannot assert that the sort of considerations I am stressing were conscious elements in the situation (nor am I encouraging the reader to believe there were not). We cannot read people's minds. But I am describing reasonably fairly, I think, some interesting elements of the situation, and elements that are entirely typical of such situations.

And the critical thing which OST did was to frame the technical issue in a way that produced an answer which nontechnical people (or, equally important, technical people who did not happen to be specialists in computers and nuclear weapons development) could appreciate. That is, the answer was not a qualitative one: "the risk is significant (or insignificant)," which left open room for endless argument over where the line was between significant and insignificant. It was a concrete answer: what was at stake was a possibility that the Russians would end up with the equivalent of one extra BESM-6. Eventually, of course, a qualitative argument would have to be made: that that was worth worrying about or not worth worrying about. But now the qualitative judgment would be tied to something concrete, and to something to which a nonexpert could apply his own common sense.

Now the Serpukhov case is striking in that a simple question was available that dealt decisively with the problem of setting the technical issues into the context of the overall policy judgment. On a more complicated issue, what is likely to be needed is a line of questioning, not a single question, and the resolution of the questions may be more difficult and more subject to debate. In other

24

words, I do not want to suggest that hotly debated technical issues can routinely be easily resolved by finding some bright fellow to ask the right question. But the basic point remains the same: the key step is to find people who combine technical sophistication, a feeling for the policy side of things, and a policy point of view which, if not identical to that of the decision-maker, is at least not antagonistic to it: such people will then usually be capable of "getting a handle" on the problem. And this "getting a handle" will typically take the form of a line of questioning which strips away many of the technical issues as not really critical to the decision, and leads to a distillation of those issues which do count into terms that the nonspecialist can appreciate.

Let me now comment on the three qualifications: technical sophistication, a feeling for the policy side of things, and a certain degree of sympatico with the point of view of the decision-maker. The last of these is necessary and at the same time risky. The risk, of course, is that if the technical advisers share their principal's predispositions, we may find them reinforcing his own blind spots; but that is a necessary risk because the decision-maker must rely on his staff to compress and summarize those elements of the issue with which he cannot (for lack of time or lack of expertise) deal himself; and the people who do this necessarily must be people whose point of view is sufficiently close to his own so that the decision-maker can have some confidence that they are doing the job the way he would want to do it himself if he did have the time and expertise.

(This point of view has two dimensions: if the decision-maker is the President, he wants the ultimate staffing to be done from a White House point of view--rather than from the point of view of someone unable or unwilling to move beyond seeing the problem from a particular agency of the government; he also wants the personal point of view of the staffing to be at least reasonably congruent with his own in terms of such things as the view of the US role in the world, and on at least some issues, sensitivity to American politics.)

25

The usual and to some extent even unavoidable practice for protecting the decision-maker from becoming captive of his own preconceptions is to have a stage in the proceedings in which "many flowers bloom," followed by ultimate staffing by persons sharing his point of view. I will defer a discussion of the mechanics of how this works with regard to technical issues under the current Kissinger system until later in the paper. Here we can simply note that the formal interagency staffing provides opportunity for various parts of the government to have their particular viewpoints heard; and on the special expert panels commonly set up to help with technical issues, it is routine to include people with a range of views at least as wide as the decision-maker deems respectable and even a bit wider.

All of this may or may not be adequate to protect against self-deception. That will depend on the qualities and energies of the decision-maker and his staff. There is no magic arrangement of organization charts and procedures that can guarantee this will be done well.

Of the other two criteria, it is worth noting that the need for technical sophistication in part reflects a consideration of efficiency. In our Serpukhov case, for example, there is no reason why a bright lawyer with no technical background could not have posed the question in the way OST did. Even on more complicated issues that is often the case: that the critical line of questioning, once discovered, is not something that <u>required</u> a technical man to think of asking it. But the time it takes a man to get read in on an issue and the amount of assistance the staff man himself needs will naturally be very large if every technical point has to be explained to him. On the other hand, no high-level staff man, even if he is a leading expert on some particular area (say, computers), will be dealing with technical issues in his particular area of expertise more than a small fraction of the time. Consequently, what is important in such positions is a quick mind and a good general background in technical matters rather than great expertise in any particular area. Consequently, a great scientific reputation or even a great deal of formal scientific training is not a necessity.

The third requirement is a sense of policy: that is, a certain shrewdness in seeing where technical considerations intersect with policy. The useful technical adviser will be politically (and bureaucratically) as well as technically sophisticated.

In sum, then, the technical adviser--the man whose job is to distill the judgments of technical experts into policy-relevant technical advice--should be distinguished very clearly from the technical expert whose judgment is needed on some well defined technical question. Very often, indeed as a general rule, the technical adviser is, or at least at some time in his career was, an expert in some particular technical area. For it was probably as a technical expert that he gained entree into the world of policy. But in his role as technical adviser that expertise will no longer be central. (Sir Solly Zuckerman, the senior technical adviser to the British Government, is a biologist, expert among other things in primate reproduction. If he suddenly forgot everything he ever knew about the sex lives of apes, his value to the British Government would not be markedly diminished.) This dichotomy--that technical expertise is generally the route to an important job as technical adviser but is not critical once in such a job--creates occasional striking instances of the Peter Principle The State Department's unhappy experience with a series of respectable but ineffective science advisers a decade ago provides several examples. (But the fact that there was a series of such examples, rather than an isolated one, suggests that something might have been wrong with State's ability to use technical advisers: a point we will return to in Part II of this paper.)

I do not think I can overemphasize the distinction between an issue which requires a technical decision and an issue which requires a political decision that takes into account technical considerations. We are concerned with the latter. The handling of conflicts in technical judgment is typically very different for the two cases. The clearest example of the former is the decision between two competing technical approaches to an R&D problem. If expert judgment is divided, even among experts with no strong vested interest in the outcome, a choice then must be made with the knowledge that it is a technical

gamble. Facing the same situation (a sharp division among the experts) on a political issue with technical content, the decision-maker will typically _avoid_ a choice: he will look for a way of handling the problem that se... reasonable considering the fact that it is uncertain how the technical situation will develop. In the former case the decision-maker needs a judgment on where to put his chips in a known risky situation. In the latter, he wants to know how the risky technical situation relates to the policy decision. He will want to make a decision that will not be too bad whichever technical judgment might be better. So in the former what is needed is technical judgment; in the latter, an ability to become aware of the nature of the technical uncertainty and to appreciate how that technical uncertainty affects the larger policy issue.

We come now to the last of our generalizations. In the course of the preceding discussion, we have already seen ample evidence that--

3. The _staffing of technical aspects_ of a political decision is itself a political process. The parties to the process (including the decision-maker) are all to some nontrivial degree seeking to strengthen their own position (or that of their organization or their school of thought) in terms of influencing the decision at hand or (especially if that seems hopeless or unnecessary or unimportant on this particular issue) in terms of future decisions.

Of course this kind of generalization applies to the staffing process across the board. (For example, the present NSC system can be looked at from various points of view; but the most instructive is

to look on it as a design for strengthening the hand of the White House as against the operating agencies.[5]).

The most striking indication of the political nature of the staffing process is that the formal staffing (and often the formal defense of a decision after it has been made) tends to focus more heavily on narrowly technical issues than the role that such issues play in the decision would really justify. This section will be mainly concerned with why this happens. Serpukhov provides us with an explicit example of this tendency. We will then consider the kinds of situations we can surmise arise in the staffing of a much more complicated and much more important problem such as in SALT staffing.

From interviews with participants, we find that arguments about the adequacy of the safeguards to be imposed at Serpukhov occupied more of the staffing effort on the issue than any other matter. Of itself this is curious, since safeguarding against misuse of a computer is a highly technical subject, so much so that even people with strong technical backgrounds would have difficulty following the arguments if their backgrounds did not include specific expertise in computers. Few of the participants were so qualified.

The amount of attention focused on the safeguards problem is even more curious when we notice that there was probably no one involved in the issue whose opinion was likely to be changed by the resolution, if any, of those arguments. Those who favored the sale were persuaded that the whole problem of a significant national security risk from the sale was a nonproblem. From their point of view, it made practically no sense for the Russians to try to cheat, even if they were almost sure to get away with it, and the damage to Western interests even if they did cheat and get away with it would be minimal. Consequently, whether the safeguards provided a high

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5. Or, put another way, a design for strengthening the role of national interest as against the parochial interests of particular agencies; which formulation you prefer naturally will depend a good deal on how well you like the system, a judgment which is well beyond the scope of this paper. The NSC setup is discussed in Part II.

risk of detection in the event of diversion or only some very modest risk was an issue that had no real impact on the wisdom of going ahead.

(When, in the earlier phase of the Serpukhov issue, a rather elaborate outside study concluded that high-confidence safeguards would be difficult and expensive, those who favored the sale were disappointed; if a contrary result had been reached, their position would have been much strength.. But their views on the policy issue changed not at all.)

On the other hand, if you were opposed to the sale, then again it is hard to see how the arguments on safeguards were likely to affect your position. For a striking aspect of the case was that the more serious risk was not that the Russians might conceivably divert the equivalent of one BESM-6 to military purposes, but that the mere fact of providing Western equipment relieved the Soviet computer industry of the need to provide four or five BESM-6s to handle the Serpukhov work load. One or several of these computers might then be applied to military applications. So if the Russians were severely limited in their capability to produce computers, then the hypothetical risk of diversion of part of the Western-supplied installation was not as serious as the "indirect diversion" which would automatically result. On the other hand, if the Russians were not severely limited in their ability to produce BESM-6s, then it would be hard to see why they would be much tempted to divert even if the risk of detection were no more than the inescapable possibility of a defection or some other gross security leak. Even minimal formal safeguards, merely raising the cost of diversion without seriously raising the risk of detection, would seem quite adequate.

Consequently, it is hard to imagine someone (at least someone of reasonable judgment) whose view on the good sense of the sale was really likely to depend on the arguments for and against the strength of the proposed safeguards.

Why then did the safeguard issue play a major role in the staffing of the issue? We have at least the following explanations:

a. Under pressure from allied governments (and our own commercial interests), all encouraged by the relative easing of cold war tensions over the past decade, policy on export controls had been relaxed to the point where it was bureaucratically unpromising to push the "indirect diversion" argument. If the sale was to be denied, the rationale, if not the reason, had to be the risk of direct diversion (either immediately at Serpukhov or as a result of other sales that might follow in the wake of Serpukhov). Hence anyone opposed to the sale really had little choice but to push the safeguards argument. A weak reed is better than none.

b. The issue could be seen as tactically useful even if there was no real prospect of denying the sale. For one thing, even assuming the sale would be approved, pushing hard on the safeguard issue made it more likely that relatively strong safeguard provisions would be a firm part of the arrangement. Those who wanted the safeguards as stringent as possible would certainly have been in a weaker position if they had agreed immediately to approving the sale, and only then started staffing the safeguards provisions.

c. Finally, the technical issues get studied just because they are something that <u>can</u> be studied. Whether in this kind of situation the Russians were at all likely to try to cheat was not the sort of thing that could be staffed out at great length. Opponents of the sale would perforce argue that the risk of diversion was worth worrying about. Proponents would tend to regard this position as paranoic if serious and devious otherwise. There would be practically no "hard" evidence to be offered on either side, and, consequently, nothing much to talk about. In contrast, given a technical issue, experts can be called in, calculations can be done, schemes can be devised and rebutted, parameter estimates can be argued about. People can keep themselves busy, and to some degree, even entertained.

So the question of just how we might try to deter or detect Soviet cheating, assuming they would try to cheat, was studied and argued about in great detail: far more time and effort went into this than into the question of whether the risk of Soviet cheating in this matter was a serious issue even if there could be no high-confidence safeguards.

Of these three sources of emphasis on technical issues, the first two were generic to the particular issue at hand, although parallel incentives on other issues are certainly commonplace. But the third goes to the basic character of technical analysis. No doubt even on issues with no technical component, we will often find that the fundamental and largely controlling judgments receive relatively little attention in the staffing process, while a great deal of attention is focused on relatively unimportant detail. But the tendency is greatly enlarged where there are technical issues, which lend themselves so naturally to detailed analysis and argument and which, in principle at least and often even in practice, may lead to a reasonably clear resolution.[6] The situation is so pervasive that anyone who had been much involved in systems analysis is familiar with the anecdote about the drunk who was found on his hands and knees searching under a street lamp. He is looking for his wallet. Where did he lose his wallet? In the alley across the street. Then why is he looking for it under the street lamp? "This is where the light is."

Anecdotes are not meant to be taken literally. As a general rule there is a certain amount of usefulness to the technical analysis,

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6. If the question is a political one--how important is an independent South Vietnam to the United States, for example--it is entirely implausible that staff studies will resolve the question. No one expects it. When someone asserts that it is (or is not) terribly important, everyone realizes that this represents a political judgment, which may or may not be sound, but which can hardly be proved one way or the other. When someone makes a strong assertion about a technical matter--the feasibility of SAM upgrade to a strategically significant ABM capability--the opposite is assumed: that careful analysis will at least indicate the range of uncertainty about this assertion, and might even flatly settle the issue.

even when the issue is not terribly important. The work done on computer safeguards was quite possibly worth all the time and resources spent on it. It clarified the issue and led to a better understanding of what kinds of safeguard measures would be relatively sensible. It narrowed the range of argument between those who favored and those who opposed computer sales to the Communist bloc. And it relieved the President of the need to make a <u>stark</u> decision: no one had to argue that Defense was being silly, merely that the safeguards were on balance adequate. It was a sort of thing like writing the present paper: modestly useful, if not terribly important.

If we turn to the SAM upgrade issue, the situation is beginning to be different. In the Serpukhov case, no one's opinion of the basic issue was likely to be changed whether the technical analysis indicated a fairly high or only a very modest chance of the safeguards detecting a violation if one occurred. Even the leverage of the adversaries was not likely to be much affected by anything short of an unlikely clear-cut determination that the safeguards were practically foolproof or practically meaningless. SAM upgrade, though, is at least potentially an example of the contrary situation. If indeed it were technically reasonable for the Russians to upgrade what looked like anti-bomber defenses into an effective ABM, or merely to a not too obviously ineffective ABM, then even strong arms controllers would agree that the issue is a serious one, requiring careful handling at SALT. On the other hand, if it could be shown that effective SAM upgrading is technically implausible,[7] then even strong skeptics on SALT would have to concede that the issue is not much worth arguing about; for example, not one on which a demand for inspection need be made, or for obtrusive controls. In short, on this issue, the outcome of the technical analyses could be imagined

7. Either in an absolute sense, or because US tactics are available to penetrate such a system, or because such upgrading could be detected unilaterally by the United States in time to counter it.

to have an effect on the leverage of various parties, and might even actually change some minds.

Nevertheless, it seems likely that to many participants in the staffing of this issue what was involved was scarcely more germane to the basic issues than the safeguards issue on Serpukhov. For example, to the substantial body of opinion that regards it as pretty implausible that any ABM would work at all well against a large attack, it is hardly likely to seem plausible that a system partially crippled in advance by a restriction to configurations that look like bomber defenses could be a serious threat. On the other hand, to people favorably impressed with the promise of ABM defenses, SAM upgrade can look like a nontrivial problem. There is room for many other gradations of opinion, as indicated in the Introduction to this issue earlier in the paper. The mere fact that some people take the issue seriously while others regard it as frivolous encourages a lively degree of mistrust and mutually reinforcing tendencies to deviousness among the participants.

If we take another example from SALT--the risk that the US Minuteman force might become vulnerable to a Soviet SS9 strike--we have an issue that all parties regard as worth a good deal of worry. Nevertheless, we can expect that even here a good deal of the analysis will settle into detailed subissues that are unlikely to affect many judgments. For given widely varying views on what kind of (or even whether any) SALT agreement would be wise, we can confidently assume that the analysis of the Minuteman vulnerability problem will narrow the range of extreme positions, but still leave major disagreements, with one or another party insisting on the importance of technical subissues which it believes critical, or merely finds it convenient to regard as critical.

In sum, we find:

a. As long as a decision has not been reached (or even as long as related decisions can still be influenced) technical arguments are never completely resolved. Aspects of the technical situation will be unambiguously settled; sometimes these will even be the critical

aspects, as in the case of "sizing the maximum risk" in the Serpukhov example. Nevertheless, technical argument will go on. Although there is no generally reliable rule, the tendency is one of diminishing returns: more and more time is spent on technical details of less and less relevance to the decision. And the participants are aware of this.

b. The reason the technical arguments go on is that until the issue is resolved there is always some participant or another who sees some marginal or tactical advantage from pushing a technical point, and thereby forcing any real decision to a higher level. Unlike similar political arguments, the position is not likely to simply be entered as one man's or one agency's opinion. The opinion can be supported or rebutted, or at least clarified, by detailed technical analysis. So as long as time and resources are available, there is more analysis to be done.

c. The process, nevertheless, has certain positive results. The big question on Serpukhov was whether to approve the sale. Much of the argument over safeguards was, at best, only marginally relevant to that question. Nevertheless, given a decision to go ahead, specific details had to be worked out, notably on safeguards provisions, and at least some of the staffing that was done in connection with the basic question would have been needed at that point anyway. Similarly, on SAM upgrade, the important question was whether this was an important question. Nevertheless, even assuming the ultimate judgment will be that this issue was not very important, a negotiating position was required, and the detailed staffing presumably proved useful in working out those details.[8]

A natural response to this optimistic view is to ask, if indeed the issue is of marginal importance, then how much value is there in doing a better job on the details? What difference does it make if you win 90 percent instead of only 40 percent of a prize that is not

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8. At publication (April 1972) the resolution was still closely held, and perhaps not yet needed.

worth much to begin with? One answer is that the real cost is what the economists call the "opportunity cost," which might be low. Another is that sometimes the exercise is useful for its own sake. Perhaps neither Serpukhov nor SAM upgrade was worth the time and effort put into staffing it. But there are certainly issues of the same general character--that is, involving the reliability of provisions to deter or detect violations of international agreements--which are very important. The experience in staffing these issues is likely to have some relevance when other, more important, matters are faced.

Finally, and really controlling, the staffing serves a significant political purpose. Such considerations as morale, public relations, and internal diplomacy encourage holding down the number of occasions in which people or organizations with a claim to be heard on an issue are shut out of the staffing, or their views brushed aside as not worth considering. All this naturally escalates when there is concern about the losers seeking and finding a sympathetic hearing in the press or on Capitol Hill.

In short, there are reasons--not always reasons we rejoice in, but nevertheless reasons that reflect the facts of life--for the excessive or degenerative aspects of technical staffing. These are largely consequences of the political elements in the staffing process, and their very existence confirms the important role of the political elements.

We conclude by offering the following, which (when taken in a reasonable dosage) will provide the novice sound guidance regarding the staffing of disputed issues in general, but which apply especially to the staffing of technical elements among agencies and offices with conflicting policy views.

Rules of Thumb

1. Seek to formulate the overall issue so that the problems on which you can speak with the greatest authority are critical.

2. Seek to frame the technical issues in a way which supports your policy position.

3. Do not give away information which does not support your policy position; insofar as possible, avoid complying with requests for information which is likely to be used against your position.

4. Assume all representatives of viewpoints other than your own reflect some appropriate combination of bias, ignorance, or incompetence.

5. Act on the assumption that other participants in the process are either (a) operating according to these rules, or (b) do not understand what is going on.

PART II

What has dominated this paper to this point is the richly political character of everything that touches the application of technical judgment in a political context. In the balance of the paper, though, I want to turn to some comments of a more speculative character regarding the current NSC arrangements and, more particularly, the role of the Department of State.

1. <u>The Kissinger System</u>. I mentioned earlier that a key to understanding the current NSC system is to view it in political terms as a device to maximize control of decisions in the White House. Let me now explore that a bit further.[1]

The Kissinger system consists of two pieces: a visible part, which is doubtless important, and an invisible part, which is <u>very</u> important. The visible part is the formal interagency staffing which culminates in a paper sent to the President laying out the parts of the problem on which all participants are agreed, the places where they disagree, statements of agency viewpoints on the points on which they are in conflict, and, finally, a list of options accompanied by summary pro and con statements for each option and a report of which agencies support which options. If the issue is important, a formal

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1. It is worth stressing that in discussing the NSC system, I am dealing <u>only</u> with the formal National Security Council system under Dr. Kissinger. Not all issues involving foreign policy are in fact handled through this system. On a number of issues, for example many involving telecommunications policy or foreign trade, other White House or Executive Office staffs may play the principal role; and indeed some issues that might seem primarily matters of foreign policy, but which have strong domestic implications, may end up on the domestic side of the White House. A separate study would be required to produce a good analysis of what has become a very complex White House system.

NSC session may be held which parallels the written paper, although this happens less frequently now. Kissinger opens the meeting with a summary of the issue and of what is agreed and of where there are disagreements. The NSC members defend their positions. The President decides, but not necessarily or even probably at the meeting.

This is the visible, formal part of the process. The invisible part consists of what advice the President receives outside the formal process. At a minimum this includes a cover memorandum prepared by Kissinger (or for his signature by one of his staff). This paper accompanies the formal paper prepared by the interagency committee. What these cover memoranda are like we cannot explicitly say. Few people ever see one, and anyone who has seen one is not likely to talk about it since that would be a good way to make sure that he never sees another one. But since the cover memo is the product of a human being rather than a committee, we can safely assume that it is typically more briskly written and cogent than the formal document, and for that reason alone likely to be more influential.

The sources of information for these cover memos include the interagency working groups doing the formal staffing (NSC staff members sit in on the formal staffing, although they generally avoid taking a position), supplemented by informal inquiry among such people as the NSC staff chooses to consult. These may include informal contacts with people involved in the formal staffing and also the use of unofficial advisers. Little is known of the details of this invisible side of the Kissinger system.

Now, as has been widely reported and indeed advertised, the salient element of the formal staffing is that the various agencies participating are not expected to work out a common, agreed recommendation. To the contrary, they are specifically enjoined against papering over disagreements or working out compromise positions. The formal purpose of this is to provide the President with a set of frankly argued options, not a compromise joint recommendation. The contrast here is sharpest with the Eisenhower system, although it is easy to overstate the extent to which even Eisenhower (with his taste

for "completed staff work") really allowed serious decisions to be made by such compromises.

But aside from whatever value the formal options and statements of agency positions may have, the effect of this procedure, and an explicitly desired effect, is to enhance the White House staff's ability to obtain information and to enhance its freedom of action. The agencies are encouraged to argue with each other, which gives the NSC staff man participating a good deal more insight into what the agency views really are and on what they are based than if the interagency staffing consisted largely of a kind of negotiations to work out a compromise paper. And of course the fact that the agencies are commonly divided forces the President to make the decision, which is what he wishes.

The NSC staff is further given a large role in defining the detailed questions to be addressed during the staffing and the procedure for addressing them, which strongly reinforces the White House leverage. The final salient element, which supports the previous ones, is that all participants are encouraged to take positions on any aspects of a problem they care to comment on. This is another lever for encouraging debate among the participants in the staffing, rather than a dividing up of the issue with Defense given carte blanche to assess the military implications, State to assess the alliance politics aspects, and so on. To me, this is a very important element of the Kissinger system.[2]

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2. A striking example of the contrary situation occurred in the fall of 1963. A Joint Staff paper evaluating the state of the war in Vietnam concluded that things were going very well. A State paper pointed out that it was possible to analyze the same data the JCS had used and reach exactly the opposite conclusion. McNamara thereupon signed a protest to Rusk arguing that State had no business second-guessing Defense's judgment of the military situation. Rusk replied, agreeing, and assuring McNamara that it would not happen again. The Kissinger system is specifically designed to encourage rather than discourage such questioning. (See United States-Vietnam Relations 1945-1967, 12 books (Washington, D.C.: Government Printing Office, 1971), 3:17 and 24, and 12:579-589.) But the desired result cannot be assumed to follow automatically from the arrangements. It can be argued that the system also discourages a serious sense of responsibility among the agency participants, who can feel that (continued)

40

The encouragement of adversary confrontations, when it is effective, is likely to play a particularly important role where technical issues are involved. So, too, is the role of informal advice outside the regular staffing. In any analysis, whether the issue is political or technical or mixed, critical questions are:

- What are the assumptions which are driving the conclusions?
- Are there flaws in the logical structure linking the assumptions and the conclusions?
- How much confidence can be placed in the conclusions, given the uncertainty there always is about just what assumptions should be made?

When the issue is political, there is rarely any vital reason to address the validity of analysis in an explicit and detailed way. The link between assumptions and conclusions is almost always rather short, and very often nothing more than: "Here is how the situation looks, and here is our judgment of what should be done." The assumptions themselves, if formally stated at all, will be largely qualitative in nature, and if not stated can generally be easily inferred (if not necessarily easily accepted). The link between assumptions and conclusions, if formally spelled out, will be stated in everyday language, or at least some bureaucratic equivalent. None of this makes it less important to ponder questions about the validity of the analysis when the issue is political. But it does mean that no one with an alert and skeptical turn of mind is likely to be deceived into mistaking an unsupported assumption for a solidly based conclusion. Consequently, whether to explicitly demand that proponents of a view contrary to your own state and defend their assumptions will

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the decision is going to be made in the White House, quite possibly on grounds of which they are unaware or can only suspect, and that therefore what they say is not really an important input to the decision. In this situation, it becomes easy to imagine each agency stating its pro forma position with little attempt to argue with whatever an opposing agency cares to say in its part of the paper. At least occasionally, one gathers, this happens.

41

commonly be a <u>tactical</u> matter: the questioner is almost certain to be able to predict what answer he will hear before it is given.

The situation is very different in technical analysis.[3] In particular, the language linking technical assumptions and politically relevant conclusions will be largely mathematical, often these days in the form of a computer program. It is thus not merely incomprehensible to most officials, but often complex and difficult enough so that even technically trained people must work at ferreting out just what has been done. In theory, all the important assumptions in the analysis should be clearly stated. In practice there are frequent lapses and important assumptions are left "buried." Even when assumptions are stated, their significance is not always either immediately apparent or adequately explained. (The recent controversy over the competence of the ORSA study of the ABM debate provides numerous examples of such lapses not only by participants in the partisan debate on the ABM, but by the ORSA Committee which attempted-- without much success--to provide an unbiased, dispassionate assessment of what had happened.[4])

In these circumstances (staffing of technical issues in a political context) there is great value to the fact that the Kissinger system encourages adversary relations among agencies. The Kissinger staff, however large by previous White House standards, remains very small, given the number and complexity of the issues it has to deal with. (A total of four people, for example, are available to work on technical aspects of SALT, not all of them full time.) That the participating agencies (ACDA, State, Defense, OST) are encouraged to

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3. I include here strategic issues when the assessment turns at least in part on technical or quasi-technical judgments about such things as the performance of weapons systems or about what kinds of scenarios are most relevant, or what tactics the adversary is presumed to be using.

4. ORSA Journal (supplement), September 1971. For mainly critical comment see insertions in the Congressional Record by Senators Cooper, Hart, and Symington, February 17, February 29, and March 7, 1972.

challenge each other's technical studies plays a critical role in enabling the NSC staff and nontechnical members of the "verification" working groups to get a grasp of what the technical arguments are about and what they might have to do with policy judgments. Nothing else so effectively reduces the risk that unrecognized assumptions more consistent with an agency's policy preference than with reality will be controlling technical analyses.

On the other hand, there is at least the risk of a weakness in the way the system has been used. The number of people with whom the President has direct contact seems extremely limited. Kissinger himself, one receives the impression, is energetic and imaginative in reaching out (through the informal side of the staffing process) for help in assessing the technical component of issues. But the President deals mostly with Kissinger. Kissinger himself, of course, has a great deal to do. He consequently must rely heavily on his staff. That staff, in turn, is good at listening to debates among the agency representatives and in obtaining their own informal advice, but they rarely have a first-hand knowledge of the detailed technical considerations. What I am suggesting is that there seems to be a rather long chain between people with a direct, first- and under-standing of the details of a technical argument and the information which finally reaches the President. An enormous burden appears to fall on Dr. Kissinger to assimilate, summarize, and interpret for the President the content of a great many issues. There must be special difficulties where this involves technical matters, since Kissinger is not himself particularly experienced in such matters.

Certainly the job could not be done if Kissinger actually had to rely exclusively on the formal output of the interagency staffing. There is really no way to do an effective job of staffing such issues without reaching out for judgments or technical details (and, in particular, on what technical details really count) from outside the bureaucratic gamesmanship that inevitably afflicts the formal staffing. Given the pressures of time, certain legitimate needs for privacy and (overlapping with privacy) politics--the use of informal staffing is

unavoidable. Yet the use of informal advice is vulnerable to the risk that the decision-maker may receive a judgment that is unsound and yet which goes unchallenged because the participants in the formal staffing likely to challenge it do not even know it has been made. It is in this context that the connection under the current system between the decision-maker and those with detailed first-hand familiarity with the issues looks tenuous.

(Since drafting this I have seen a similar complaint made re generally, stimulated particularly by criticism of the handling of the India-Pakistan matter. It is hard to judge how valid the complaint is. The President's distance from the bureaucracy plainly has certain advantages, which may well outweigh the difficulties that occasionally can be charged to it. As is true of almost everything else in this paper, the points made particularly about the use of technical staffing should be viewed as a special case of the general problems of staffing. Some points become more striking or take a different form when we focus on the technical aspect of issues. But they are never without parallels in the handling of political and other nontechnical matters.)

2. The Department of State. If we turn from the White House to the State Department, we find that everyone seems agreed that the Department's ability to deal with technical issues is better than it was five or ten years ago, in fact better than it ever has been in the past. Indeed, I found that most officials I talked to at State felt the situation was well in hand. But officials I talked to outside State were generally inclined to criticize the department, and that is my own inclination, as will be apparent in the comments to follow.

The basic problem for the Department of State is that, for the reasons described earlier in this paper, the technical analyses provided by various operating agencies will certainly be influenced by and at least occasionally controlled by the overall policy views of those agencies. To give a single example: if the Defense Department favors deployment of a nationwide ABM, that will follow from the department's overall judgment on the wisdom of the deployment,

44

including Defense's appreciation of the political effect that having the ABM will have on international relations. This overall judgment is then certain to have some effect on the technical analyses presented by Defense. If State has no choice but to accept Defense's analyses of the technical merits, then State's ability to make an independent evaluation of the political desirability of the system is correspondingly limited.[5]

For surely a judgment on the political desirability of an ABM system will be influenced by such technical considerations as how much confidence there could be that the system would work. Further, even if State reached a political judgment contrary to Defense's it would then be handicapped in arguing for its view at the NSC level. Defense would not hesitate to question State's views on how (for example) Soviet or allied behavior might be affected by whether we deployed an ABM. But, in the absence of technical competence of its own, State would have no effective means to question Defense's technical assertions about how credibly the ABM could do what it is being sold as doing. Consequently, State would be handicapped both in reaching its own judgment and in advocating that judgment at the NSC level.

It is important to understand that an ability to question technical assertions does not require technical resources anywhere comparable to those required to carry out full-scale technical analyses. Misunderstanding of this point occasionally leads to statements that it is hopeless to expect State to be able to match the technical resources of agencies like Defense, the AEC or NASA. Obviously it is, but that is not what is required. Nor is there any need for State to be able to claim that its assessment of a technical issue is superior to that of the agency with direct responsibility for the

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5. This example is illustrative. In fact, State seems sharply divided in its attitude towards ABM, and consequently some officials welcome strong DoD assertions about the technical promise of ABM, while others are motivated to strong suspicions about such assertions.

technical appraisal. That too is impractical, not only because State cannot realistically expect to have command of sufficient technical resources to make such a claim carry much weight, but also because of bureaucratic constraints.

But what might be obtained without asking for creation of a vast technical staff in State and without expecting State to assert major authority on technical issues is a reasonable capability to ask shrewd technical questions and perceive the political significance of the answers.

The problem, in fact, is not limited to matters in which there might be an explicit conflict of policy views between State and another agency. Consider the case of Skybolt.

On Skybolt, State's problem was not due to any difficulties that might follow from allowing undisputed authority over the assessment of the technical situation to a rival agency with a conflicting overall policy view. For no clear conflict existed. Defense in this case had no strong view on the issue which concerned State. I do not mean to assert that all, or even necessarily the majority, of State officials shared the policy positions attributed to "State." But the people whose views counted most did, again excepting Rusk. McNamara's decision to kill Skybolt was based on the weapon's utility (or lack of it) to the United States. He was not motivated in this instance by a strong desire to either help or hurt the British independent deterrent. State, for its part, had no real interest in the question of whether Skybolt would be good for the US strategic force. But the policy level at State felt a strong interest in moving to end a British independent deterrent. Consequently McNamara's proposal to cancel Skybolt was not viewed as an unwelcome development.[6] But when the outcome was that the

6. Here and throughout this discussion, by "State" I mean the involved senior officials of the State Department with the exception of Secretary Rusk, an exception which came as a belated surprise to his colleagues. See George Ball's account in his The Discipline of Power (Boston: Little, Brown and Company, 1968), Chapter VII, especially p. 100f.

United States agreed to sell the British Polaris missiles--a considerably more credible basis for an independent deterrent than Skybolt--most of the senior policy level at State was appalled. And while I certainly would not assert that State's inability to head off what it judged as a most unfortunate result was a consequence of its limited technica... capability--I do not believe that weakness in technical matters played more than a secondary role--I will argue that this technical weakness was a nontrivial element in the situation.

From the start, anyone who took even a casual interest in the technical side of the situation would have been aware that there were grave doubts within the Pentagon that Skybolt would ever be built. The civilian staff of the Secretary of the Air Force was always bearish about the program as were studies done at RAND and elsewhere, and as were many senior Air Force officers oriented towards ICBMs. The contrary view was primarily held among Air Force officers with strong convictions of a need to maintain the bomber force; this was highly significant since the pro-bomber generals were dominant in the Air Force. But optimism about Skybolt was not the monolithic view of the Air Force as a whole, much less the dominant view of the Defense Department as a whole.

But at that time at least (over a decade ago), almost no one in State paid much attention to such things. Nor was the British Government concerned by the technical uncertainties about Skybolt's performance: Skybolt came to look dispensable to the United States, which could compare it to other strategic weapons in the US arsenal, such as Minuteman and Polaris; but the British compared Skybolt to nothing, and found it the preferred alternative. Thus the British Government moved steadily deeper in committing its prestige (in British domestic polities) to the assumed availability of Skybolt and with no emphatic warning from our embassy in London about the risks of doing so. I do not mean that the British Government was taken totally by surprise by news of Skybolt's cancellation. Through the whole period there were repeated warnings to the British technical experts about the riskiness of the project, including war ings from

very senior technical officials on the American side, such as the presidential science adviser (Jerome Wiesner) and the Assistant Secretary of Defense for Research & Engineering (John Rubel). But the impact of these warnings was negligible in the face of a combination of emphatic contrary judgments conveyed in conversations between senior Air Force officers of the two sides, plus a British preference for acting as if they had no doubt that Skybolt was coming along. What was lacking was explicit discussion of the problem at senior political levels of the two governments. That never took place until the affair had reached crisis. Neustadt is very good in ferreting out the political and bureaucratic factors in this failure of communications. But the upshot was that the British were left in a position to claim, with <u>some</u> justice, that the Americans had promised them Skybolt, at least tacitly acquiesced in the Macmillan government's making Skybolt the keystone of its entire defense policy, and now abruptly proposed to cancel development of the weapon. At the end State was upset when Kennedy yielded to the British pleas that we could not just kill Skybolt without offering the opportunity to buy something else plausibly as good. But if we look for reasons things went awry (assuming, as Ball and others feel, that the Nassau decision was a serious mistake), I think it is reasonable to pinj int as <u>one</u> significant element the weakness of State's ability or desire to comprehend the grave technical doubts widespread in Defense about the prospects of the weapon to which the British Government was committing itself ever deeper.

Now State must have known that there were technical difficulties on Skybolt. But what makes it reasonable (it seems to me) to argue that State's technical weakness was a significan factor in the affair was that the seriousness of technical problems varied greatly depending on whose perspective you were considering. The problem was never as simple as whether Skybolt would work or would not work. As is entirely typical of risky technical developments, the question was how <u>well</u> Skybolt would work, and how much it would cost: in other words, a question of cost effectiveness. Judgments or whether

48

the development effort should continue therefore depended critically
on how much you valued Skybolt. The US Air Force valued it highly,
as explained in the Introduction (p. 2); so did the British Air Force
and the Macmillan government. From their point of view, McNamara's
rationale for killing Skybolt was entirely inadequate. Even a Skybolt
that cost a good deal more than promised and performed a good deal
poorer, was still worth buying.

From McNamara's point of view, though, the cancellation made
very good sense. He felt no vested interest in the weapon. To the
contrary, there was interest at this time in exploring an arms control
agreement with the Soviets under which both sides would phase out
their bomber forces. Thus to McNamara, Skybolt could look militarily
unnecessary, expensive, and on top of this, an impediment to phasing
out bombers since it would be awkward to move toward getting rid of
bombers and at the same time be pursuing a program that would eventu-
ally cost at least $2 billion to provide the bombers you were
contemplating getting rid of with an auxiliary weapon to extend their
useful life. Today, of course, the "bargaining chip" argument has been
applied to argue that such an apparent inconsistency is really advan-
tageous. But whatever the merits of that argument today, it was not
an attractive argument in 1962, when the administration's problems
with Congress always stemmed from the need to overcome pressure from
Congress for expanding military programs, rather than the contrary.

It hardly required great technical sophistication to perceive
all this. And once it was perceived, by someone in State, it required
no technical sophistication at all for senior State officials to
comprehend it if the situation was explained to them. But if no one
in State perceived the subtleties in the situation, State would
also fail to foresee the difficulties that cancellation of Skybolt
would stir up. For if you had the simplistic view that the technical
problems with Skybolt were a black-and-white matter of whether it
would work or not, then you could see that the British Government
would be embarrassed by cancellation, but not that it would have any
serious grounds for feeling (or claiming) that the United States

shared the blame for that embarrassment. The United States could hardly be blamed if, after trying in good faith to build the weapon, it found that the thing just could not be built, especially given the long record of warnings from our technical people to theirs about the riskiness of the development.

I have been unable to determine whether or not in fact anyone in State correctly perceived the technical situation and its political implications. Perhaps someone did, but no one would listen to his warnings. But, if so, that would appear to indicate that whoever in the State Department was responsible for perceiving this sort of connection between technical issues and their political implications was not someone with access to the policy level of the department. What does seem clear, though, is that the policy level at State failed to perceive what in hindsight seems to have been the quite foreseeable impact of the decision to cancel.

Of course it can be argued that the fault lay with McNamara and his people for being so single-mindedly focused on the desirability of killing Skybolt from their point of view that they failed to perceive (or chose to ignore) the problems the cancellation would cause for State. I think it is proper to criticize McNamara on this point. But it still seems quite naive for State to assume that it is up to other agencies to perceive problems of special interest to State, and to take them as seriously as State would want to do.

When the crisis finally broke, although it was State not Defense which had a strong interest in the outcome, the staffing of alternatives was done at Defense with little State participation. State settled for making political arguments against letting the British buy Polaris. But that did not meet what the President (supported, or at least not opposed, by Bundy, McNamara, and--as State learned to its dismay--even Rusk) felt he needed. The President was not prepared to tell the British they were just stuck with the cancellation of Skybolt. He wanted an alternative. While nobody argued with State's view that Polaris was the least desirable alternative from our point of view, everyone at all familiar with the technical

50

and strategic side of this issue realized that Polaris was almost
certainly the alternative the British would want if they had any
sense, which they were presumed to have.[7]

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7. The alternatives were allowing Britain to continue develop-
ment of Skybolt at her own expense; providing Hound Dog air-to-ground
missiles; and inviting the British to join in a Multilateral Nuclear
Force.

The last involved giving up the British independent deterrent
for participation in a force whose military utility no one could quite
define. Characteristically, State was enthusiastic about the MLF
because it liked it politically, and was largely uninterested in argu-
ments about its military disabilities, even though these had a large
impact on the possibility that the Europeans would ever invest their
resources in such a scheme. The MLF was particularly unattractive
to the Macmillan government which had virtually staked its political
life on maintaining an independent British deterrent. (Macmillan
told Kennedy, when this came up at Nassau, that he was hardly prepared
to spend a lot of money so that British sailors could sip tea with the
Portuguese.)

It was scarcely more attractive for the British to undertake
completing Skybolt development--a matter of at least half a billion
dollars--only to have bought a weapon whose credibility was undermined
by the very fact that the Americans had deemed it not worth buying.
This would not have been such a problem if there was general support
for the independent deterrent in Britain. Then the British Govern-
ment could have explained why the weapon suited Britain even if it
did not interest the United States. (High accuracy was demanded for
the specialized missions envisioned by the United States; but all
the British wanted was something that could credibly hit a target
the size of Moscow.)

But this explanation was not enough in the actual British context,
where the credibility of the British deterrent, even if the United
States also bought Skybolt, was very much in dispute. (Skybolt was
no longer any use to him, Macmillan complained: "the lady has been
violated in public.")

Finally there was Hound Dog. A minor problem was the name: how,
the British asked, could the safety of the British nation be asserted
to depend on a weapon called the hound dog? A major problem was that
Hound Dog, essentially a   bot airplane, was not a clearly superior
weapon to the V-bombers the British already had. Skybolt, a ballistic
missile, would be invulnerable to the air defenses which threatened
the credibility of the V-bombers as a retaliatory force. Not so
Hound Dog. Again, the credibility problem was magnified by the
substantial doubts within Britain that even Skybolt would be adequate
for a serious deterrent.

Polaris, on the other hand, had undisputed credibility. It was
most emphatically the preferred alternative.

Yet an alternative was available, although not one that Defense officials would like, and consequently not one which they would be motivated to propose. This would have been to <u>not</u> cancel Skybolt in December, as planned, but to set up a joint US-British committee to review the situation. From Defense's point of view, this would not be an attractive idea; it would tend to complicate McNamara's domestic political problems in canceling Skybolt, and it would be a waste of some money. But from a national point of view, it made a good deal of sense, and indeed once the crisis broke McNamara's deputy (Gilpatric) himself suggested this alternative. But by then it was too late. The lady had been violated in public.

At a minimum, as Ball has argued,[8] this approach could have put off the crisis until after the question of the British application for entry into the Common Market had been resolved, which just might have made a difference in De Gaulle's veto, even though that does not seem likely. It would have given Macmillan a chance to control the impact of the situation on British domestic politics, rather than be faced with an embarrassing <u>fait accompli</u>. It just might have made enough of a difference to allow the State opposition to providing Polaris to win out. Nothing can be proved. But the opportunity to do better was there. And it seems to me fair to argue that a significant element in the reason the opportunity was lost was State's failure to perceive the political implications of the technical situation until it was too late. In short, State did not show itself alert to the policy implications of the technical situation; nor was it effective in promoting its own policy view; and perhaps there may have been <u>some</u> connection between the two.

I emphasize again that none of this would have required State to be in the business of telling Defense how to do detailed design of weapons systems or anything comparably abstruse. We are talking of nothing more than an ability to grapple with such things as the costs of various alternatives, their basic strategic assets and liabilities, and fairly elementary physical consequences of the sheer size and shape of the weapons that were being considered; in short,

8. The Discipline of Power, p. 1024

things which really should not have been beyond the grasp of people whose primary interest and expertise was the conduct of foreign policy. (By "elementary," I do not necessarily mean considerations that would be grossly apparent to someone who had not spent some time thinking things through; rather, I mean things which, once someone had thought things through, could be thoroughly grasped without any need for great technical expertise. The BESM-6 analogy used in the Serpukhov case earlier in the paper was another example.)

So I will argue that what State could have used was a greater capacity for and interest in asking shrewd but essentially simple questions about the technical situation and for relating the answers to the policy problem. From what I have seen, there was little effective capacity of that kind, in large part because there was little or no feeling at the top of the department that such a capacity would be desirable. Rather, the prevailing attitude in the top echelon at State appears to have been that its job began when McNamara formally proposed to cancel Skybolt and was complete when the President was offered a political judgment on the unwisdom of letting the British have Polaris. Foreseeing what was coming and finding an alternative that the President might judge viable considering the technical facts and costs (in dollars and in political terms other than those of prime interest to State's Europeanists) was someone else's problem. From State's point of view, it had done its job; if things went badly that was the fault of the President and McNamara.

Of course, that was all ten years ago. By general agreement, State's ability to handle the technical side of policy issues is now better. Consider, then, today's situation, which I will describe in terms of State compared to the NSC staff which has so largely supplanted what was once thought (and at least in the long-ago age of Acheson was) State's role.

53

State's concerns are on the whole much like those of the NSC staff. With relatively rare and unimportant exceptions, State need not concern itself with technical decisions. But it must often (or at least often ought to) be concerned with the impact of technical considerations on a political decision.

Let me list some parallels and contrasts between the NSC problem of dealing with technical considerations and State's.

1. In both organizations the principal need is for technical advisers rather than technical experts, recalling the distinction introduced in Part I between the way these terms are used in this paper.

2. The direct, in-house staff resources available to the two organizations are, in terms of numbers, quite similar. The NSC staff includes a handful of people who, though not themselves scientists or engineers, have a good deal of experience in dealing with technical studies as inputs to policy issues. The same is true of the State Department.

Both organizations also have available a few professional scientists and engineers. For the NSC, they come from the OST professional staff. (The one actual scientist on the NSC staff--a recent arrival--holds a dual appointment as an assistant to both Kissinger and to Edward David, head of OST; one of his principal functions is to serve as liaison between the two staffs.) For State, the parallel staff resources consist of a few individuals in State's Intelligence and Research Bureau, a few others (dealing with military matters) in the Bureau of Political-Military Affairs; others (dealing with non-national security matters) in the Bureau of International Scientific and Technological Affairs, and, on some issues (not entirely limited to arms control), liaison with the technical staff of the Arms Control and Disarmament Agency. It is hard to be precise, but at least in rough quantitative terms the resources available to State and the NSC are comparable.

Although such a comparison between NSC and State resources was never suggested to me at State, it does offer an intuitively reasonable

support for the view I encountered among nearly all State interviewees: the view that State was adequately staffed for dealing with the technical component of issues.

But now let us turn from these parallels and consider some contrasts.

1. The NSC access to what I have called "informal staffing" is far superior to that of State, at least in terms of quality. Whether it is a question of obtaining the services of an outstanding nongovernment expert or of obtaining the cooperation of experts inside the government, there is no comparison between the response that the NSC staff can command and what State can command. There will be few people outside the government, and none within, who find themselves "too busy" to respond to an NSC request for help. Further, the risks involved in giving the NSC information which might prove questionable, or conspicuously motivated by an interest in influencing the outcome, is certainly perceived as higher than the risks in treating casually or manipulatively a request from State.

2. The NSC staff is, under the current system, in effective command of the formal staffing process. Whoever is in command can assure that issues he regards as important are throughly staffed, special studies commissioned, questions formulated in what he regards as the proper way and studied by groups he has confidence in. The NSC staff is acutely alert to the leverage this provides.

3. The NSC staff is essentially in the position of being the group which the agencies are trying to persuade, rather than a group which must rely on being persuasive to others. This shows strikingly in the fact that NSC staffers working with the interagency study groups typically <u>avoid</u> taking a position. They have no need to do so. They do not need to persuade the agency representatives, rather the reverse. Eventually a paper laying out the options will be sent forward to the President. There will be a cover memo in which the NSC staff gives its opinion. Few, if any, participants in the formal processing will see that memo. A decision will come down in the form of a brief memorandum from Kissinger reporting what option the

President has selected. There will be no explanation of why the
President has chosen that option. Quite obviously, the detailed
demands on a staff which must make judgments, but which rarely need
provide a detailed defense of those judgments against adversary
views, are quite different from those of a staff which is not free
of that obligation.

4. Next (and a point closely related to the previous one) the
NSC staff is in a markedly stronger position to question agency
positions than State (or any other operating agency). It is true,
as stressed earlier, that the Kissinger system encourages the agencies
to question or even oppose the positions of other operating agencies
on issues principally within the other agencies' domain. State is
indeed perfectly free to question the OSD or JCS judgment on the
seriousness of the SAM upgrade problem or the risk in endorsing the
sale of the Serpukhov computer. But for State to question is not at
all the same as for the NSC to question. If the question comes from
State, it is likely to carry little weight unless supported by a
cogent case showing why skepticism regarding Defense's position is
justified, and this requires staffing to develop. If the NSC ques-
tions an agency position, the burden falls on the agency to provide
a more solid basis for its position, not on the NSC to provide a
detailed line of argument to justify the question.

5. There is a final difference of another character. I mentioned
that neither the NSC nor State relies much on people with formal tech-
cal training reporting directly to the top of the organization
(Kissinger in the NSC case, the Secretary and Under Secretaries in
in the State case). I am not talking about whether there are occa-
sional technical briefings at this level, naturally given by technicians.
This is true in both organizations. Rather I am talking about high-
level policy advisers with a quantitative bent. Kissinger has always
had a senior staff assistant so oriented (although with an exceptional
amount of turnover--Larry Lynn, Wayne Smith, now Phil Odeen). None of
these people have been scientists or engineers. But all combined
political sophistication with extensive experience in preparing

quantitative analyses bearing on policy questions. There is no one really comparable at State; no one whose specific inclination and clear assignment is to seek out elements of a policy issue which can be dealt with quantitatively or to explicitly deal with the quantitative arguments that may have been made by other agencies. I am inclined to view this as symptomatic of a basic weakness of State, for reasons I will try to develop in the next section.

Simply making up such a list of parallels and contrasts between the NSC and State goes a long way, I think, towards resolving the conflicting impressions I mentioned earlier: that is, the impression of people inside the Department that it is about as well equipped as it need be to deal with technical issues and the impression of many people outside that State remains weak despite improvements over the past decade. For we have seen that the actual resources available to State are comparable to those available to the NSC, but the role each has to play is very different. In particular, State bears a burden of persuasion which the NSC does not. So it is easy to under-stand that people within State would feel comfortable (from the inside you do not sense any difficulty in making policy judgments for lack of adequate technical advice), but people outside might tend to find the department weak (in the sense of being an unimpressive ally or adversary). This effect would then be strengthened by the absence in State of quantitatively oriented staffing at the policy level, in contrast to the situation at Defense and other operating agencies and within the NSC staff itself.

At this point let me report two comments I received during interviews for this study, both from men with experience as, or work-ing with, policy-level officials going back to the Eisenhower administration. From a current senior official outside of State: "State isn't very good at dealing with technical issues, but it doesn't make much difference. In this administration the decisions are made

in the White House, and under the NSC setup the White House gets adequate treatment of technical issues from varying points of view without the need of help from the State Department."

From a senior State Department official of the 1960s: "State does not have a strong capability, and is never going to have, for a simple reason. No Secretary of State is going to be willing to argue, for example, with the Defense Department that its evaluation of a weapon's performance is wrong, no matter how much he suspects that is the case. He just won't do it. He will want to make his case in political terms, where his responsibility lies." As an example, the former official reached back to a personal experience during the Eisenhower period. State was wary of the deployment of intermediate range missiles to Turkey. It believed the move to be politically unwise. It also believed there was no good military case for the deployment either. It was, in fact, hard not to be aware that the military experts were sharply divided. But the Secretary of State (Herter) was unwilling to challenge Defense on technical c military questions. He limited his argument to political ones. That, my informant assured me, is what a Secretary of State will always do.

The aspects of the Kissinger system emphasized previously have to some degree--but only to a modest degree--put the second of these statements out of date. State is now invited to comment on the technical side of issues and does so. But as my first informant (and several others who seemed to be in a good position to judge) reported, State does not do so very effectively. There apparently was a significant trend towards a more affirmative role a year or two ago, but this seems to have reflected the personal tastes and abilities of Elliot Richardson as Under-Secretary. That tendency, I gather, has regressed since Richardson's departure. We have, in contrast, this comment (obtained second hand) on the issue of computer sales used to illustrate much of this paper: from an Assistant Secretary, "I'm sure it's true that the security risks in this are unimportant, but when the guy from Defense pounds his fist on the table and insists its damn important, it is hard for me to argue with him." No doubt this

attitude is not universally held in the department. But my impression is that it remains common, despite the encouragement offered under the Kissinger system.

Yet the Turkish IRBM example cited by my informant itself tells a rather pathetic little story about what is at least an interesting element of weakness. State limited its arguments to political ones. And it lost that battle. The IRBMs were sent to Turkey. Political arguments did not carry the day—in particular they did not carry the day in a context in which State was unwilling or unable to question Defense's assertions about the military value of the deployment. Yet the fact was that the challenge could easily have been made. As Herman Kahn wrote in 1960: "The land-based IRBMs have a major defect.... By the time they are emplaced all know of their second strike weakness, and their possible usefulness as a first strike weapon looks like a disability to most observers."[9] And indeed the weapons turned out to be a source of awkwardness, and (possibly) danger, since Khrushchev may have taken the deployment, which was substantially in response to US concern about a missile gap, as his precedent for putting his missiles into Cuba at a time when the gap faced the other way. The Turkish IRBMs were removed in 1963.

My point is not that the deployment decision was definitely a mistake, although as Kahn's comments and subsequent events suggest, there is at least a good case for that view. Nor do I argue that if State had been willing to question Defense's technical and strategic assumptions the decision would have been different. Very possibly it would not have been. But I think it is reasonable to argue that State would have stood a noticeably better chance to uphold its view (which in hindsight looks very reasonable) if it had been able and willing to argue the technical-strategic issues.

The same, I think, is true of the computer issue. In this case the State view carried the day, in large part because of the strong and well-defined position on the technical issues taken by the President's science adviser, which nicely fitted the politics of the

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9. Herman Kahn, On Thermonuclear War (New Jersey: Princeton University Press, 1960), p. 459.

situation (the personal appeal to the President from the Prime Minister). State itself was not an effective proponent of the decision, even though it strongly favored the sale. Yet why should State have been at all ineffective in this case? Once the technical experts, under OST's leadership, had agreed that one BESM-6 was the size of the problem, then why should State have been shy about demanding to know on what basis Defense judged that Russian access to the equivalent of one more BESM-6 would be a significant threat to our national security? That argument did not require a computer expert, and indeed on this matter Defense's representative was himself no more an expert on computers or nuclear weapons design than was State's.

In short, despite the generally agreed improvement in State's capability between 1958 (the time of the Turkish IRBM issue) or 1962 (the climax of the Skybolt affair) and 1971, State continues to be more shy of and less capable of dealing shrewdly and confidently with the technical aspects of policy issues than we might reasonably expect.

We next consider some possible reasons why this is so and how and under what circumstances we might expect it to change.

A basic difficulty probably derives from the fact that the sort of judgment on which a State official will have built his career is almost exclusively qualitative. (Attempts to apply mathematical methods to international politics have thus far been almost purely academic, in all senses of that word.) Mathematical arguments, indispensable for any detailed discussion of a technical issue, form a mode of discourse that is simply foreign to all but a few State officials--it is "all Greek to me." Even those State officials who do not feel lost in the face of an argument that includes calculations are likely to feel like a man in a foreign country who has picked up a smattering of the language--enough so that he feels he can follow the discussion between two natives and even put in a few words himself, but the sooner the discourse can be returned to a language in which he feels really fluent, the better.

An asymmetry in this is that the technical adviser does not have a parallel problem at all: if anything, he will be overly confident of his own ability to comprehend and make judgments about the political elements in the situation. Unless he is so narrow a technician that his advice even on the technical side of the problem is likely to be of little use, he will be perfectly willing, and at least sometimes even competent, to comment on the political side of the problem.

Two subsidiary problems are aggravated by or flow from the basic disability of not knowing the language.

First, there is in general a natural propensity to believe that the parts of a problem you do not feel comfortable in dealing with are really not very important.

Second, the politically-influenced character of technical advice bearing on a policy issue, and of the very process by which that advice is developed, has consequences that encourage the propensity to think the technical arguments are unimportant:

a. To start with, conflicting technical arguments purporting to prove both sides of an issue are routinely encountered. This encourages the view that the technical arguments are merely window dressing for prior, politically based judgments. Therefore, a plausible and very attractive line of reasoning for persons who feel uncomfortable when faced with technical arguments is to believe that setting aside all these contrived arguments and focusing exclusively on political judgments is the fastest way to the heart of the issue.

b. Next we saw in Part I that indeed technical arguments often drift into relatively--sometimes absolutely--inconsequential byways.

c. Finally, when an official inclined to dismiss technical arguments as not very relevant to policy questions talks to a technically sophisticated advise, he can pretty well count on the technical adviser confirming his inclination. He is very likely indeed to be told by his technical confidante that the issue really requires political, not technical, judgment.

Such considerations explain the attitude that seemed to me prevalent at State but they do not, I think, justify it. Paralleling the three points, we can respond:

a. To assume the technical inputs are unimportant because both sides of a controversy commonly present technical analyses purporting to prove their own side of the issue is a little like a judge deciding the facts of a case are unimportant because the lawyers on each side always present briefs purporting to show how the facts support their own client.

b. Because technical arguments often degenerate into relatively inconsequential byways hardly implies that all technical arguments are inconsequential.

c. Finally, when the technical adviser tells his political friend that what is really needed is political judgment, he commonly means something different than what his political friend would like to believe he means. He rarely means that the technical background is irrelevant. What he means, almost always, is that, when the technical arguments are digested and put in proper perspective (a process which itself, as I have argued in the first part of the paper, typically requires at least implicit political as well as technical judgment), the major issues left to be argued about are the political issues. Another technical adviser--influenced by his own policy predilections or those of the man he is advising--is probably giving the same advice to his man, but based on a quite different interpretation of the technical side of the argument. Often enough this line of advice (on the primacy of the political judgments) reflects the technical adviser's feeling that his advisee will not be bothered to follow the technical arguments, or is incapable of following them, so that the best thing the technical adviser feels he can do is to reassure his man that he need not lose confidence in his political assessment.

And so to sum up: the tendency within the department to believe that technical arguments are almost always irrelevant to policy is easily understandable. Aside from the reasons just given that tendency is further encouraged, no doubt, both by bureaucratic

resistance against losing power to a new kind of adviser, and by the perfectly correct perception that narrowly technical advisers have little to say that really seems shrewdly relevant to policy.

But it would be a mistake to accept that tendency as a wise and permanent thing. In the absence of a practical test, it cannot be proved that stronger technical capability in State would make a real contribution, but it is, I think, a reasonable supposition, and one I found shared by most of the officials outside of State interviewed in connection with this study.

Close to the heart of the problem is this impression: there seems to be no one dealing with policy in the department whose standing depends substantially on his ability to make and provide his principal with a line of argument to effectively defend judgments on the relationship of technical considerations to larger political issues. (The most likely exception, the Science Bureau, is simply cut out of most high policy areas to which technical arguments are likely to be relevant, especially strategic armaments and national security policy generally.) Consequently there is, I believe, no one at State who has the combination of access to high policy levels, interest in policy questions, and a particular stake and interest in how technical arguments bear on such questions. But it is only that sort of person who is likely to be in the position of credibly telling senior State officials when and why the technical assessments they take for granted may be unsound, or when and why the assessments they are inclined to dismiss as inconsequential really are important.

This has, I think, the effect of weakening State's capacity as an organization to adequately assess some policy issues, and it weakens State's ability to play a leading role in advocating its view on any policy issue on which other agencies can bring technical arguments to bear.

Perhaps my view is incorrect. Yet it could be tested by an experiment which would involve only a very modest commitment of

State resources. A prerequisite is real interest in the problem at the top of the department. Given that interest, we can envision a special assistant to the Secretary or an Under Secretary with the responsibility described in the paragraphs above. It is necessary that he be known to have direct access to the policy level, and that he can sit in on policy meetings and have access to policy papers on those issues on which he reasonably sees a role for himself. It is not <u>necessary</u> that he be a scientist, any more than it has proved necessary for the equivalent officer on Kissinger's staff to be a scientist. But a sound general literacy in technical matters is obviously required; together with a high level of bureaucratic and political shrewdness, for reasons described in some detail in the first part of this paper. It would be preferable to have a small staff even at the outset, but again, no staff is absolutely required. His job is not to cover all technical matters with political implications relevant to State. It is merely to seek out targets of opportunity, and to test the hypothesis that such a person can carve out a useful role at the policy level of the department. If he cannot succeed, then a larger office behind him probably would not have made a critical difference, while demanding a substantial office would make it harder to get the experiment moving. If he does succeed, then a larger office will follow in the natural course of events.

I stress again that the previous section reflects my impressions, and to some degree, no doubt, my prejudices. I cannot prove the assessment is correct. Readers with a more intimate familiarity with the department than I can claim no doubt will make their own judgment, accepting as much or as little of my view as fits their own experience. But the proposed experiment offers something significant to gain and practically nothing to lose.

A few summary comments and conclusions suggest themselves, with which I will close the paper:

1. State, despite unquestionable improvements in SCI and in the degree of sophistication on technical issues with such bureaus as Political-Military Affairs, INR, and the Planning and Coordination Staff, is still not able to carry much weight on such matters.

2. State itself is not particularly conscious of this (although other agencies are). I think this is partly because of the great temptation to believe that more technical sophistication would not really be relevant to policy judgments, but also because at a time when State's general position within the government is conspicuously weak it is hard to be particularly conscious of weakness in technical advice to the policy level as a critical element.

3. Under the present, heavily White House-centered, NSC arrangements, the weaknesses that I have been asserting exist at State may not be terribly important to the government at large. In any event, it is hardly a salient element in the present context.

4. If State expects to even partially regain the status it enjoyed during the immediate postwar years, I believe a stronger technical capability would be required, and setting out to acquire enhanced capability would be an asset in any effort to even partially reestablish State's role.

5. The need or more of the sort of policy-relevant technical advice this paper has been concerned with should not, although it often is, be confused with an argument for strengthening the present Science Bureau. There is no necessary reason why staff people interested in the relation of technical arguments to policy, and inclined to try to develop quantitative arguments bearing on policy, should be centered in the present Science Bureau with its focus on substantially different class of problems and with substantial operational responsibilities. I am certainly not arguing against strengthening the present Science Bureau, much less arguing that it should not be strengthened in its capacity to deal with "science in policy" as opposed to science policy. I am merely pointing out that science policy and science in policy can usefully be distinguished, and that the director of a staff concerned with the former need not be the right man at all for the latter, and vice-versa.

65

6. Finally, it must be noted that the <u>principal</u> reason for the weakness of State's staff resources (assuming I have not unreasonably asserted that weakness) lies at the top of the department. If there is no lively interest at the top in such matters, then there will be no pressure to recruit people to deal with them, no pressure on people who have adequate background--of which there are some now in the department--to sharpen and exploit their skills, and no incentive for people whose particular interest is in providing technical advice on policy questions to come to the department or to stay if they do come.